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EVALUATION OF MONTANA'S DAM SAFETY PROGRAM

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Dam safety in Montana has become a critically important issue because of the severe safety deficiencies found in many of the state-owned dams. But numerous dams not owned by the state have similar problems.

The present Montana dam safety program relies on a composite of efforts at the federal, state, and local levels of government. The federal government, through the Corps of Engineers, has conducted a comprehensive inventory of non-Federally owned or licensed dams which exceed certain size criteria. Both location and ownership of these dams are noted in this inventory. An inspection program funded by the Corps is directed at those inventoried dams of such a size and location that their failure could conceivably cause loss of human life and severe property damage. Inspections are aimed at assessing the safety conditions of these structures. Reports of inspection results describe the repairs needed to make identified deficient dams safe. The inspection program is administered by the Dam Safety Section within the Engineering Bureau of the Montana DNRC and currently supports safety inspections for state-owned dams, dams owned by local governmental units, and non-Federally licensed private dams.

Each dam owner is responsible for making the necessary repairs to bring their structure up to an acceptable level of safety. The Montana dam safety law gives county attorneys the responsibility for ensuring that the owner of an identified unsafe dam meets these obligations.

This paper first describes the Federal program and how it has helped Montana assess the extent of the state's dam safety problem. Montana's participation in the Federal program is discussed and problems relating to a continuance of this effort are identified. Important provisions in the Montana dam safety law are presented next and responsibilities of both the state and local levels of government are detailed. Dam safety programs in other western states are compared with Montana's and short-comings in the present Montana program are noted. Deficiencies in the areas of technical/financial assistance for the repair of existing dams and in providing for the review of designs of new structures are given particular emphasis. Finally, the needs for an effective dam safety program in Montana are outlined.

#### The Federal Dam Safety Program

Following the failure of a West Virginia mine tailings impoundment and the resulting disastrous consequences, Congress enacted the National Dam Inspection Act (PL 92-367) in August, 1972. This law authorized the Secretary of the Army, acting through the Corps of Engineers, to carry out a national program for the inspection of non-Federal dams. Since dams owned or licensed by the Federal government were given attention through an already existing safety program, Congress saw no need to make these structures subject to the provisions of PL 92-367.

Under PL 92-367, a dam was defined as "any artificial barrier, which impounds or diverts water, and which is 1) twenty-five feet or more in height from the natural bed of the stream or water course to the maximum

water elevation or 2) has an impounding capacity at maximum water storage elevation of fifty acre-feet or more." These standards were known as "qualifying criteria" because they made such a structure subject to inspection under the Federal law.

Before inspections could be conducted, the Corps felt it necessary to undertake a nation-wide inventory of non-Federal dams meeting the "qualifying criteria." Along with size, ownership and location, dams were also rated as to their hazard potential. High hazard dams were those meeting the "qualifying criteria" and in such a location that failure would cause loss of life and appreciable property damage.

As a result of this program, nearly 4,000 "qualifying" dams have now been identified and located in Montana. Only 3 states (Kansas, Texas and Oklahoma) of the 50 inventoried have a greater number. Of the 4,000 Montana dams, there are at least 109 designated "high-hazard" structures. A few more additions to this list are expected before the inventory is completed in mid-August, 1980.

Although PL 92-367 provided for the inspection of non-Federal dams, funds were not provided for the inspections at the outset. In 1977, following several dam failures and the extensive publicity given these events, interest in actually implementing a national inspection program increased markedly. Subsequently, Congress allocated \$15 million dollars in the 1978 Public Works Appropriation Act (PL 95-96) to initiate the inspections authorized under the

1972 legislation. The inspections were to be based on the previously conducted inventory.

Late in 1977, in the wake of the Toccoa Dam failure in Georgia, the President announced that he had directed the Secretary of the Army through it's Corps of Engineers to immediately begin the inspection of designated high-hazard dams. This inspection effort was to extend through September, 1981. The importance of state cooperation was strongly stressed. The President also emphasized that the Federal inspection program would not relieve either the states or other dam owners of their liabilities and responsibilities concerning public safety. The responsibility for taking measures to mitigate the risk of failure would continue to rest with state authorities and the owner.

Although the inspection program has significantly improved the State's capabilities to implement a dam safety program, there is no provision built into the present Federal law for ensuring full, effective continuance of this effort. While Montana is under no legal obligation to institute a state-funded dam safety program of its own, Federal financial support for the present one will cease in September, 1981.

#### State Participation in the Federal Dam Safety Program

In 1978, the Montana DNRC received an appropriation through the Corps of Engineers to support a state-operated inspection program for all non-federal, high-hazard dams in Montana. The responsibility for handling this effort was given to the DNRC's Engineering Bureau and its Dam Safety Section.

Using the Federal funds, DNRC hired four consulting firms to do much of the inspection work. Field inspections are usually a joint effort between the contracted consulting firm, DNRC dam inspectors, the owner, and other interested parties.

During the course of the inspections, a dam is evaluated according to the very strict inspection and safety guidelines used by the Corps. Hydraulics and the structural adequacy of the spillway while routing a recommended design flood are assessed. Visual inspections are also made to identify stability problems and to evaluate the general condition of the embankment. Seepage problems are noted and operation and maintenance is assessed. The results of the inspection are analyzed and written up by the consultant. Specific recommendations to address identified deficiencies are detailed. Copies of the inspection report are distributed to the DNRC's Dam Safety Section, the owner of the dam, and the Governor. In addition, the report is meant to serve as a guide for local government officials given the responsibility of ensuring the repair of the unsafe dam.

Of the 109 high hazard dams selected for inspection, 83 have already been investigated. Inspections of the additional 19 dams should be completed by mid-August, 1980. Inspection reports have yet to be completed for most structures but the last of these should be finished by June 30, 1981. Based on preliminary findings, it is anticipated that 75-85% of the dams inspected will be found unsafe.

Since 1973, state-owned dams have been inspected annually by the DNRC dam safety engineer. As reported in a previous issue paper (Can the State

Maintain Its Dam Projects? Lois Steinbeck, March, 1980), the inspections turned up many deficiencies, some of which required emergency repairs. Prior to 1979, approximately \$30,000 per year had been allocated by each of the legislatures to cover major expenses for the succeeding biennium. In 1979, the State legislature failed to appropriate the necessary funds to continue this inspection program, presumably because of the influx of Federal funds to address dam safety. As a result, inspection of the 20 state-owned, high-hazard dams is now entirely dependent on money received through the Corps to support the general dam safety program. Because of an increase in the number of inspections of non-state-owned dams required under the Corps funded program, DNRC's ability to see that state-owned dams are adequately inspected is reduced.

#### The State of Montana Dam Safety Law

That portion of the Montana Code relating to dams and reservoirs (Chapter 85-15-101 through 85-15-304) contains several provisions relating to dam safety.

First, section 85-15-101 states that the proposed means of construction must be adequate: "No person must fill or procure to be filled with water any reservoir which is not so thoroughly and substantially constructed as to safely hold any water that may be turned therein." Neither state law nor present administrative codes contain any specific criteria regarding acceptable design or construction of non-federal dams, however.

Second, the state dam safety law gives DNRC the authority to inspect all dams in the state that meet the standard criteria of being 25 feet or higher or of having a storage capacity greater than or equal to 50 acre-feet at maximum water elevation. It also establishes the responsibility of the department in investigating complaints made about the safety of a water retention structure by persons having downstream property which might be subject to destruction should failure of such a structure occur. Specifically, the DNRC may, on it's own initiative, and must, upon complaint by three or more persons residing or owning property in an area threatened by the offending dam, examine the dam in question.

Third, the law defines county and district court investigatory and enforcement responsibilities in dam safety. One of the more important provisions of the law in this respect is that if upon investigation, the DNRC finds a dam unsafe, it is to report its findings to the local county attorney. On the basis of this notification, it is the county attorney's responsibility to "immediately take the necessary steps to abate the danger and make the structure safe." Thus, county attorneys are responsible for assessing inspection reports and assuring that owners of unsafe dams implement the necessary repairs if continued dam operation is desired.

County attorneys have not yet been served with notifications on the unsafe dams identified in the DNRC's comprehensive inspection effort. The notification process will begin later in 1980. Pursuing these notices in a manner consistent with present state law will substantially increase the work load of some county attorneys.

In carrying out their prescribed duties, county attorneys will be called upon to use much discretion in determining the necessary measures required to make a structure safe. Because Corps criteria are very strict, inspection reports often recommend more urgent modifications than those actually needed to insure dam safety. County attorneys must take into account such considerations as the financial resources available to the owner for dam repair, physical condition of the dam, and the intensity of land use in the hazard area downstream if they are to make reasonable decisions. This in turn will necessitate an accurate interpretation of the inspection reports which provide a basis for these decisions. Because of the highly technical nature of these reports, many county attorneys will require assistance.

There are two possible sources of assistance which could be available. DNRC Dam Safety Section personnel have the capability to provide assistance in interpreting inspection reports. However, present limitations on funding for the section may preclude their assuming an extensive role in this manner. County attorneys can also contact 1 of 4 consulting firms in the state with expertise in dam safety. A substantial cost may be incurred by the county if this alternative is chosen.

Other provisions in the state law outline a procedure for investigating the safety of existing dams. The procedure is initiated by a verified complaint, filed in the district court of the county in which the dam is located, and alleging that water contained in a reservoir endangers life and property. The district judge must then appoint three individuals (one of whom is to be a county resident and one of whom is to be a competent civil or hydraulic engineer) to make a thorough examination of the dam and to file a



written report. If the examiners find the dam is not secure and that the danger is imminent, they must draw the reservoir down to a level insuring safety. If the dam is insecure but the danger is not imminent, the judge conveys the report of the examiners to the owner or operator of the dam, together with a notice requiring him to make the dam secure or draw water from its reservoir without delay. The owner of the dam may answer the complaint and the issue of safety may be tried before a court or jury. If the fact finder determines the dam insufficient, the court must judge the dam a nuisance and order that all water be withdrawn from its reservoir.

Citizens who feel that a dam is being constructed in an unsafe manner may also file a complaint with the board of county commissioners. It is then the duty of the board to appoint three experts under whose supervision the dam or reservoir must be constructed. No water can be allowed to enter the reservoir for the purposes of filling it until the owner has filed with the county clerk a certificate signed by the majority of appointees stating that the dam or reservoir is "constructed in a proper manner and is safe and secure."

Finally, Montana law provides criminal penalties for those persons owning unsafe dams which threaten the public welfare. Any person violating the provisions of Chapter 85-15 is punishable by a fine of not more than \$500 or imprisonment in the county jail for not more than six months, or both. If death results from the violation, the person guilty may be convicted of homicide. The leveling of criminal penalties indicates the significant threat posed by a hazardous dam.

## Comparative Evaluation of Dam Safety Programs in Other Western States

There are large variations among the western states in topographic conditions favorable to reservoir development and in the climatological factors and water use requirements contributing to the need for water storage. Thus, there may be major differences in the types and densities of dam developments and in the problems of public safety they present in each state. Because of such differences, some variation in the extent of state actions and resource commitments for dam safety may not necessarily be adverse to the public interest.

Even with these considerations in mind, however, a comparative evaluation with dam safety programs in 15 other western states indicates severe deficiencies in Montana's program. Table 1 summarizes evaluations of various aspects of current dam safety programs in Montana and the other western states. State programs were evaluated by the staff of the respective Corps of Engineers field agency responsible for administration of the National Program for Inspection of Non-Federal Dams in each particular state. This summary shows that there are two major problem areas which dominate the current dam safety program in Montana and, to some extent, in other western states. These are; 1) an inadequate legislative base for a fully effective program and 2) lack of sufficient state-funding for dam safety programs.

The United States Committee on Large Dams has promulgated a model state law for the regulation of dam developments which has been the pattern for legislation adopted in several states. Based upon this model law as supplemented by the experience of state and federal agencies and private dam

engineering firms, a state dam regulatory agency should perform the following basic functions to insure the adequacy of dams and reservoirs:

- (1) Review and approve the plans and specifications to construct, enlarge, modify, remove or abandon a dam or reservoir.
- (2) Perform periodic inspections during construction for the purpose of insuring compliance with the approved plans and specifications.
- (3) Upon completion of construction, issue a certificate of approval.
- (4) Investigate the dam and reservoir at least every five years to determine their continued safety.
- (5) Issue notices when appropriate to require the owner of the dam and reservoir to perform necessary maintenance or remedial work, revise operating procedures or take other actions including breaching of the dam when deemed necessary.

Table 2 shows the extent to which the five basic functions listed above are being performed through the dam safety program in each of 16 western states. This summary is also based on evaluations made by staffs of Corps of Engineers field agencies. Table 2 shows that citizens in Montana, as well as in a number of other states, are not receiving the protection that basic dam safety regulatory functions would provide.

TABLE 2  
FUNCTIONS PERFORMED UNDER CURRENT DAM SAFETY PROGRAMS  
(\* indicates "yes", blank indicates "no")

State	Reviews & approves plans & specs.	Inspects during construction	Issues permit to impound water	Periodically investigates completed projects	Requires remedial work
Arizona	*	*	*	*	*
California	*	*	*	*	*
Colorado	*	*	*	*	*
Idaho	*	*	*	*	*
Kansas	*	*	*		*
Montana <sup>1</sup>					
Nebraska	*	*	*	*	*
Nevada <sup>2</sup>					*
New Mexico	*	*	*	*	*
North Dakota	*	*		*	*
Oregon	*	*	*	*	*
South Dakota <sup>3</sup>					*
Texas	*	*		*	*
Utah	*	*	*	*	*
Washington <sup>1</sup>					
Wyoming	*	*	*	*	*

1. In Montana and Washington the states have authorities to perform all five functions but ordinarily act only after complaints by citizens.
2. Nevada has the authority to perform all five functions, but an inadequate staff has limited activities.
3. In South Dakota, present law provides for review of plans and specifications only when a new water right is involved and inspections are made only when requested by a downstream owner or when problems are evident.

Source: Inspection of Non-Federal Dams; Summary for Fiscal Years 1978-1979. A Progress Report. Department of the Army Office of the Chief of Engineers, Washington, D.C. 15 April 1980.

## Implementing Dam Repairs: A Major Problem

During the four year, Federally-funded inspection program, numerous deficiencies were found in both public and private dams. Some of the deficiencies presented an imminent threat to downstream areas. Deficiencies found included:

- 1) Inadequate design for spillways or storage capacities to safely handle, in most cases, the probable maximum flood. Many of the dams deficient in this respect were built in the 1930's and 40's. Design criteria have changed substantially since that time. While the design of dams according to the former state-of-the-art criteria were considered adequate then, the dams are recognized as unsafe today.
- 2.) Stability problems in the dam embankments. There are no stability analyses on file for most of the dams in Montana. This indicates that the stability of the embankments are not known.
- 3.) Lack of emergency preparedness plan and standard operating plans. These plans relate to safe operating criteria as well as emergency procedures in the case of impending dam failure.
- 4.) Inadequate operation and maintenance. This has left a number of dams and appurtenances in a deteriorated condition.

Because of deterioration with age, design deficiencies during construction, and insufficient or incorrect maintenance and repair, many dams now require substantial, expensive rehabilitation.

Proper dam construction and repair is usually an extremely complex undertaking, necessitating inputs from people well versed in geology, geotechnical engineering, hydrology, hydraulic and structural engineering and occasionally mechanical and electrical engineering as well. Persons having such backgrounds are often in great demand nation-wide. This is particularly true in those states which have created a demand for such people by requiring that proposed dams meet certain design criteria before the construction phase can begin. Institution of dam design guidelines has not occurred yet in Montana and neither is there an abundance of qualified dam design personnel in the state.

In Montana, there are few sources of technical assistance for the owner of an unsafe dam who wishes to implement the necessary repairs. The Soil Conservation Service offers technical assistance in dam design, but this assistance is generally available only for dam construction and not repair. The extensive amount of time required to provide adequate assistance combined with current limitations on money and staff preclude the DNRC's Dam Safety Section from assuming an extensive role in this regard. Architectural and engineering firms are the principle source of technical assistance for dam repair efforts at the present time.

Financing dam repairs presents an even larger problem for many owners. Making needed repairs or modifications are apparently beyond the immediate

financial capabilities of many, including local governments, public corporations and other non-Federal institutions. Even the cost of the engineering study will present a severe hardship to many owners in the agricultural sector.

A recent paper dated April 4, 1980, and issued by the Office of Mitigation and Research within the Federal Emergency Management Agency (FEMA) stated that the Federal government recognizes the difficulty states face in providing adequate technical and financial assistance to repair non-federal dams. These problems are compounded in Montana because of the extraordinarily large number of dams in the state, the poor condition of many of those dams and the state's small tax-base.

FEMA is at this time investigating program and policy recommendations for filling gaps between dam owner needs and available non-Federal resources. FEMA is a new agency and has only recently been given the responsibility for coordinating a practical solution to the problem of unsafe non-Federal dams. At this time, the agency is still struggling to develop a policy which will define its role in helping states meet technical and financial assistance needs for dam repair. Until FEMA is sufficiently organized to address this responsibility, it will not likely be capable of providing effective direction. Another consideration should also be kept in mind. In the event that federal funds are provided to support state-operated assistance programs, it is anticipated that monies may first be awarded to those states having an existing and active dam safety program. Given this, the importance of maintaining some type of dam safety program in Montana is underscored.

## The Need for Review of Proposed Dam Designs

Currently, a determination of safety is not made until after dam construction has started or been completed at some expense to the owner. Montana does not officially require any pre-construction review process to assess the adequacy of a given dam design, nor has the state developed any safety criteria as a guide for the development of dam designs. Because of the disastrous impacts that dam failure can have upon the general public, institution of a government program to assure proper design and construction in order to protect the public welfare might be easily justified.

One means by which to implement such a design review process is to make issuance of the necessary water right permit contingent on the conformance of a proposed dam with a set of developed safety standards. In applying for a water right permit through the DNRC's Water Rights Bureau, the proposed means of diversion must be detailed. One of the criteria of issuance for the permit requires that the proposed means of diversion or construction be adequate. There are at present no formal safety guidelines used by the DNRC to evaluate in detail the acceptability of a dam design's hydraulic or structural characteristics (and thereby thoroughly assess compliance with this criterion) before a decision is reached on permit issuance. Neither is it common for any type of inspection to be required, nor is responsibility assigned, to see that construction is being carried out properly. Thus, the mechanism to set up a mandatory dam design review program already exists within the present water rights system pending the development of suitable safety guidelines.



In addition to the necessary water rights permit, there are a multitude of other permits which prospective dam builders must obtain before they can legally begin construction. Among these are a section 404 permit from the Corps of Engineers, a water quality permit from the Montana Department of Health and Environmental Sciences, and a streambed preservation permit from the appropriate conservation district. The state has so far refrained from requiring any permit to actually construct the dam, however.

Another problem related to permits has also arisen. It is quite common for dams to be constructed without the owner attaining some or any of these permits. This makes it extremely difficult to maintain an accurate inventory of dams in Montana. But it will also limit the effectiveness of the proposed design review process where the requirement for a water right permit is circumvented.

#### Important Issues in the State Dam Safety Program

1.) High-hazard dams are those whose failure would result in loss of human life and substantial property damage downstream. There are at least 109 "high-hazard" non-federal dams in Montana.

Inspections of high-hazard, non-Federal dams indicate that many are in an unsafe condition and will require extensive repairs or modifications to reach an acceptable level of safety. A number of these dams are state-owned.

2.) The current inventory and inspection program has allowed state officials to determine the ownership and condition of many potentially

hazardous dams in Montana. This data has not previously been available. The information provides a sound basis upon which to implement a safety program directed at eliminating the danger posed by these dams.

3.) Montana's dam safety program is presently funded by a Federal appropriation administered through the Corps of Engineers. Annual inspections of state-owned facilities are also supported entirely by these funds. Funding through the Corps is due to expire in September 1981. Unless the State of Montana appropriates money for this purpose, annual inspections of state-owned and other dams will cease altogether.

4.) Under the current state dam safety law, county attorneys will be responsible for insuring that the owners of unsafe dams identified through the inspection program take the necessary action to bring those dams up to an acceptable level of safety. County attorneys have not yet been served with the notices and technical reports that will form the basis for these enforcement measures. When the materials are delivered, it is likely that many of the attorneys will require some type of interpretive assistance to adequately execute their responsibilities.

5.) The lack of applicable technical and financial assistance available to owners will severely hamper efforts to bring identified unsafe dams up to acceptable safety levels.

6.) The safety of a given dam in Montana has generally been determined after construction has been completed. At present there are no design guidelines, nor is there any review requirement, to assure the adequacy of a

proposed dam from a safety perspective. The present water rights permit issuance system provides a possible framework for a mandatory design review process.

WHAT WILL HAPPEN IF THE STATE TAKES NO FURTHER ACTION  
ON THE DAM SAFETY PROBLEM?

If this were to happen, no funds would be appropriated by the 1981 Montana Legislature to support a state dam safety program for the succeeding biennium. Federal funds supporting the present program are due to expire in September, 1981. Therefore, without state funds, there would be no dam safety program in the State of Montana after this date. The following are the major immediate ramifications of such a situation:

1.) Inspections of state-owned dams would cease. Subsequent declines in the safety of these dams would likely go un-noticed until failures occurred or the need for emergency actions became obvious.

2.) The time, money, and effort expended in developing the inventory and inspection program for Montana dams would, to a large degree, be wasted. The program will not have achieved the use for which it was intended if action to alleviate the hazardous conditions found is not pursued.

3.) County attorneys would be left the unenviable task of ensuring compliance with the state dam safety law without the benefit of technical guidance or other information which could be provided through the present state dam safety program. Although consultants might substitute well as a

source of technical assistance, their knowledge of important administrative and legal aspects of dam safety would likely be lacking.

#### REQUIREMENTS FOR AN EFFECTIVE DAM SAFETY PROGRAM IN MONTANA

There are 3 basic needs which should be fulfilled if an effective program for dam safety is to be implemented.

1.) An Annual Dam Safety Inspection Program For State-Owned Dams Should Be Re-established.

The State of Montana owns and is liable for the operation of twenty-three dams. Prior to the current biennium, state-owned dams were inspected under a state program similar to that proposed here. Every year, the inspections have found serious deficiencies that could have caused dam failures. Without annual inspections, these deficiencies would have gone un-noticed.

Responsible management requires that each of the state-owned dams be inspected annually. During the last biennium, DNRC was able to inspect it's dams under the National Dam Safety Program. Since this program expires in 1981, it is essential that one engineer be funded to carry on the inspection program. Monies obtained from the operation of the state-owned dams could be earmarked into an account to pay the costs of annual inspections the program will require one full-time employee.

# Budget

Source	FY 82	FY 83	FTE's
Project earmarked	\$47,000	\$55,000	1.0
revenue fund			

2. Establish A State-Wide Dam Safety Program For Existing, Non-Federal Dams, Both Public And Private.

In order to enforce the existing state law relating to dam safety, and in light of the information we now have on the unsafe nature of many dams in Montana, a substantial increased effort is needed to expedite necessary remedial actions. The responsibility for implementing repairs on an unsafe dam will rest with the owner, and county attorneys will assume a major role in seeing that the necessary actions are taken. But direction from DNRC would be helpful to assist dam owners and county attorneys in a determination of the proper action to take in correcting the deficiencies. The following shows the typical engineering work needed for each designated unsafe dam.

- a. Conduct engineering studies to determine the proper spillway design flood and determine the modifications in the discharge or storage capacity necessary to safely route this flood.
- b. Conduct and place on file a stability analysis of the embankment. The completed stability analysis will determine whether modifications are needed in the embankment. These analyses must be conducted by qualified geotechnical engineers and be based upon:

1. Seismic and static loading
  2. In-situ strength properties of the embankment and foundation materials must be established by drilling, sampling and laboratory testing.
  3. Phreatic surface as determined by piezometric observations.
- c. Bring up to date the operation and maintenance requirements based on periodic inspections performed by engineers experienced in dam design and construction.

#### Budget for Engineering Work

Source	FY 82	FY 83	FTE's required
General Funds	\$120,000	\$135,000	3.0

It should be noted that conflicts between the county attorney and dam owners are likely to arise when the county attorney attempts to determine repair needs necessary to bring an identified unsafe dam up to an acceptable level of safety. Obviously the more repairs deemed necessary, the greater the expenditures that will be required by the owner. The DNRC may be called upon to assume a mediative role between the two parties. It is difficult to determine whether this could be handled without requiring additional staff.

3.) Establish A Design Review Of All Proposed Dams To Assure Compliance With Standard Safety Criteria.

The objective of this program will be to insure that new dams are built to current dam safety standards. DNRC approval of dam designs will be required for all new dams. The first task under this program will be to establish acceptable dam safety design criteria for Montana. The criteria that any particular dam must meet will vary depending on the potential hazards that the dam will create and the size of the dam. DNRC would then encourage compliance with design standards by requiring the signature of the project's professional engineer to the effect that the proposed dam will be constructed according to the safety guidelines specified during the design review process. Such a program might require as much as two technical experts, a technician, and a half-time secretary. A fee could be charged to the project owner to repay the general fund.

Source	Budget		
	FY 82	FY 85	FTE
General Fund	\$150,000	\$175,000	3.5